REMARKS

The present invention relates to a porous sheet laminate and a water resistant display sheet. More specifically, it relates to a porous sheet laminate which has excellent water resistance and can provide a display sheet suited for outdoor display and to which various printing and recording systems as well as an ink-jet recording system can be applied, and a water resistant display sheet using the same.

As described in the specification under "Related Art" beginning at page 1, second paragraph, printed recording sheets, of various types and printed by various types of printers, when displayed outdoors, and especially when the sheet is prepared by subjecting a recording sheet using an ink-receiving porous sheet as a base sheet to printing and providing a protective layer thereon, water and water vapor penetrate into the inside from a through hole exposed at the end face of the ink-receiving porous sheet. When such water is vaporized by solar energy, a very high pressure is exerted thereby, frequently causing the protective layer to rise or peel off from the printed layer, etc. One suggested solution has been to subject the end face of such an ink-receiving porous sheet to sealing treatment for the purpose of preventing water from penetrating from the end face, such as coating the end face with a resin having no water-absorbing property. However, such a method is problematical for reasons stated.

The present invention addresses the above-discussed problems of the prior art. As recited in Claim 1, the invention is a porous sheet laminate comprising a release sheet, an ink-receiving porous sheet and provided therebetween an adhesive layer endowed with a water-passing property.

The present invention is also a water resistant display sheet prepared by providing in order a printing layer and a protective layer on the surface of the above-discussed ink-receiving porous sheet.

The significance of using an adhesive layer endowed with a water-passing property (which property is defined in the specification at page 8, second full paragraph), is demonstrated in the comparative data of record for water resistant display sheets. Examples 1-5 are according to the present invention. Comparative Example 1 is similar to Example 3, except that an adhesive layer endowed with, in effect, no water-passing property, was used. The Examples and Comparative Example were subjected to an outdoor display test to evaluate the deficiency of the appearance thereof. Only the Comparative Example had a deficient appearance.

The above-discussed results could not have been predicted by the applied prior art.

The rejection of Claims 1-3, 5-8 and 12 under 35 U.S.C. § 103(a) as unpatentable over U.S. 5,034,268 (Sekidou et al) in view of U.S. 6,159,605 (Hanada et al), and further in view of U.S. 6,197,409 (Bodager et al), is respectfully traversed.

Sekidou et al discloses an offset blanket comprising, in lamination, a surface printing layer, a support layer, and a porous primer layer therebetween for bonding the surface printing and support layers (column 2, lines 43-49). The purpose of the primer layer is to produce an offset blanket in which the surface printing layer is easily peeled off and yet the surface printing layer is not peeled off in the course of printing, without excessively increasing the tensile strength of the surface printing layer and without excessively decreasing the peel strength (paragraph bridging columns 1 and 2).

Hanada et al discloses an ink-jet recording sheet provided with at least one ink-receiving layer on at least one side of a base material sheet, wherein in one embodiment, the ink-receiving layer comprises a porous hydrophilic polyurethane resin, a porous hydrophilic polyurea resin, or a porous hydrophilic polyurethane-polyurea resin (column 2, lines 34-39). Hanada et al further discloses that if necessary, a primer layer can be formed to provide adhesion to the base material sheet (column 8, lines 4-5).

Bodager et al discloses media particularly adapted to receive a pigmented ink image from an ink-jet printer for subsequent transfer to a permanent substrate, wherein the media has, in order, a substrate, a water-absorbing layer comprising a hydrophilic polymer that is substantially solid in the presence of aqueous pigmented ink, and a transparent, adhesive, ink-receiving layer that retains the aqueous ink pigment and is permeable to the aqueous ink medium (column 2, lines 18-28). Bodager et al discloses further that the substrate also may have a release layer or surface if it is desired to peel the substrate off after transfer (column 3, lines 12-14), and that an anchor layer may be used to ensure adequate adhesion of the release layer to the substrate (column 3, lines 29-48). In addition, Bodager et al discloses that "[t]he ink-receiving layer is releasably affixed to the water-receiving layer in order that it may be readily separated after being imaged and laminated to a permanent substrate" (column 4, lines 36-39). Bodager et al's ink-receiving layer has the same role as the Hanada et al's ink-receiving layer because the former is formed for the purpose of reserving the printed ink fed by ink-jet technology.

It is not clear why one skilled in the art would combine Sekidou et al, Hanada et al, and Bodager et al, but even if these references were combined, the result would still not be the presently-claimed invention. Each of the three-cited references is drawn to different, mutually exclusive, utilities, and thus there cannot be any possible motivation to combine them. Sekidou et al's offset blanket is a medium in which ink is transferred to a sheet to be printed by offset lithography. Bodager et al, like Sekidou et al, is also a medium in the sense that a transfer occurs from the medium to a sheet to be printed, except that printing is carried out by ink-jet, not offset lithography. Hanada et al, on the other hand, is not drawn to a medium but rather, to the actual printed sheet. Compared with Bodager et al, the surface printing layer in the offset blanket of Sekidou et al has a role of transferring the ink transferred by ink supply rollers to an article such as printing paper to be printed. In other

words, Sekidou et al's surface printing layer has a completely different role from Bodager et al's ink-receiving layer, such that one skilled in the art would not look to one to replace with the other.

The differences in utilities of the above-discussed prior art is sufficient in and of itself to demonstrate error in the rejection. Nevertheless, even if the utilities were the same, differences in structures among the respective prior art products strongly weigh against obviousness. Contrary to the Examiner finding at paragraph 5 of the Office Action that Sekidou et al "does teach a porous ink-receiving layer". In reply, Sekidou et al does **not** disclose a porous ink-receiving layer. Why would the offset blanket of Sekidou et al need such a layer? What problems exist in offset blankets that a porous ink-receiving layer would be needed? Neither Hanada et al nor Bodager et al supply this reason. Nor does the Examiner explain why the offset blanket of Sekidou et al would need a release layer. Neither Hanada et al nor Bodager et al provide such a reason. In paragraph 4 of the Office Action, the Examiner finds that the open and/or closed cells in the porous primer layer of Sekidou et al provides a water passing property. In reply, it is not clear that the closed cell embodiment does so, in view of the disclosure that when the primer layer includes closed cells, printing inks do not pass through the primer layer and the support layer (column 5, lines 6-14). In paragraph 7 of the Office Action, the Examiner finds that Hanada et al "provides a water-resistant (waterproof) ink-jet layer." In reply, this finding is incorrect. Indeed, Hanada et al discloses that their ink-jet recording sheet exhibits excellent absorbency for water-based ink (column 3, lines 24-27).

Notwithstanding the above-discussed differences in utilities and structures among the applied prior art, none of this prior art discloses the particular problem to which the present invention is addressed, nor Applicants' claimed solution thereto.

For all the above reasons, it is respectfully requested that this rejection be withdrawn.

In the above rejection and all the other prior art rejections, discussed in further detail below, the Examiner incorrectly assumes that all recording or printed sheets, regardless of how used, i.e., as a transfer medium or as the final sheet, and regardless of how made or used, i.e., by inkjet, thermal transfer, etc., would be considered interchangeable by persons of ordinary skill in the art such that a disclosure in one would be freely transferable to solve a problem in another. The Examiner has not, and cannot, establish this assumption as true and indeed, common sense alone suggests it is not.

The rejection of Claims 1 and 9-11 under 35 U.S.C. § 103(a) as unpatentable over Sekidou et al in view of U.S. 5,631,076 (Hakomori et al), and further in view of Bodager et al, is respectfully traversed. The disclosures and deficiencies of Sekidou et al and Bodager et al have been discussed above. Hakomori et al is now applied in place of the above-discussed Hanada et al. However, Hakomori et al does not remedy the above-discussed deficiencies of Sekidou et al and Bodager et al. Hakomori et al discloses a hot melt ink thermal transfer recording sheet, wherein said sheet has an ink-receiving porous polymer coating layer (column 2, lines 38-52). In a hot melt ink thermal transfer recording operation, a hot melt ink ribbon is heated image-wise with a thermal head to melt the ink image-wise and the melted ink is transferred to the ink-receiving layer of the recording sheet (column 6, lines 17-21).

As in the first prior art rejection discussed above, the Examiner has combined prior art with mutually exclusive utilities. The Examiner has not explained why a person skilled in the art would go to the art of hot melt ink thermal transfer recording sheets to solve any problem that might occur in an offset blanket. Again, why would one skilled in the art replace the surface printing layer of Sekidou et al's offset blanket with the ink-receiving porous polymer coating layer of Hakomori et al's hot melt ink thermal transfer recording sheet? The Examiner has provided no legitimate reason. Clearly there would be no reason to. The

present rejection is otherwise incorrect for essentially the same reasons as discussed in the first prior art rejection, discussed above.

For all the above reasons, it is respectfully requested that this rejection be withdrawn.

The rejection of Claims 14-18 under 35 U.S.C. § 103(a) as unpatentable over Sekidou et al in view of Hakomori et al and Bodager et al, and further in view of U.S. 5,647,935 (Hoshino et al), is respectfully traversed. The deficiencies in the combination of Sekidou et al, Hakomori et al, and Bodager et al have been discussed above. Hoshino et al does not remedy these deficiencies. Hoshino et al discloses a method of producing an ink jet recording medium provided with an ink-receiving layer having a porous inorganic composition as a major component, wherein the ink-receiving layer is coated onto a transferring substrate provided with a release treatment, if need be, the ink-receiving layer and a recording substrate that will become a final supporter of the ink-jet recording medium are adhered with an adhesive, and then the transferring substrate is peeled off, thereby forming a surface of ink-receiving layer replicated the surface shape of the transferring substrate onto the recording substrate (paragraph bridging columns 2 and 3). Hoshino et al discloses that the purpose of their invention is to provide a method of producing an ink-jet recording medium capable of easily and inexpensively creating an arbitrary gloss surface without injuring the image qualities in the recording medium (column 2, lines 45-53).

Hoshino et al adds nothing to the combination of Sekidou et al, Hakomori et al, and Bodager et al. The Examiner relies on Hoshino et al's disclosure of particular adhesives for their adhesive layer. However, Hoshino et al does not disclose, and does not require, that their adhesive be porous. Nevertheless, the Examiner has not explained why a person of ordinary skill in the art would assume that an adhesive, disclosed for use in providing a layer between an ink-receiving layer and an image-receiving substrate in an ink-jet recording medium, would be applicable to provide a porous primer layer between a surface printing

layer and a support layer in an offset blanket. The present rejection is otherwise incorrect for essentially the same reasons as discussed in the first two prior art rejections, discussed above.

For all the above reasons, it is respectfully requested that this rejection be withdrawn.

The rejection of Claims 1 and 19 under 35 U.S.C. § 103(a) as unpatentable over Sekidou et al in view of Hanada et al, and Bodager et al, and further in view of U.S. 5,736,356 (Ueno et al), is respectfully traversed. The deficiencies in the combination of Sekidou et al, Hanada et al, and Bodager et al has been discussed above. Ueno et al does not remedy these deficiencies. Ueno et al discloses a thermal transfer image receiving sheet comprising a substrate sheet, an intermediate layer provided on at least one surface side of the substrate sheet, and a dye receptor layer provided on the surface of the intermediate layer, wherein the substrate sheet is a pulp paper, the intermediate layer is formed from an organic solvent solution of a resin, and the dye receptor layer is formed from an aqueous resin liquid of a hydrophobic resin (column 4, lines 18-26). Ueno et al discloses further that in an embodiment wherein the intermediate layer is formed from an acrylic resin of high rigidity or a resin at least a part of which is crosslinked, the intermediate layer may have a two-layer structure by forming a cushioning layer between the substrate sheet and the intermediate layer, wherein the cushioning layer may be a layer made from a film having a relatively high elasticity or a layer containing bubbles (column 21, lines 56-65). The bubble-containing layer comprises bubbles and a binder, wherein the preferred binder is a heat-sensitive adhesive or a heat-sensitive binding agent (column 22, lines 23-68).

Ueno et al adds nothing to the combination of Sekidou et al, Hanada et al, and Bodager et al. The Examiner relies on Ueno et al's disclosure above regarding a cushioning layer. However, and as in the above-discussed rejections, the Examiner has not established why disclosures with respect to a thermal transfer image receiving sheet would have any relevance to either offset blankets, ink jet recording media, or ink jet recording sheets.

Nevertheless, even if this prior art were combined by one skilled in the art, the result would still not be the presently-claimed invention. Indeed, the structure of Claim 19 is not shown by Ueno et al. The present rejection is otherwise incorrect for essentially the same reasons as discussed in the first three prior art rejections, discussed above.

For all the above reasons, it is respectfully requested that this rejection be withdrawn.

The rejection of Claims 4 and 19 under 35 U.S.C. § 112, second paragraph, is respectfully traversed. Indeed, the rejection is now moot in view of the above-discussed amendment. Accordingly, it is respectfully requested that it be withdrawn.

Applicants respectfully call the Examiner's attention to the Information Disclosure Statement (IDS) filed January 16, 2004. The Examiner is respectfully requested to initial the Form PTO 1449 submitted therewith, and include a copy thereof with the next Office communication.

All of the presently pending and active claims in this application are now in immediate condition for allowance. The Examiner is respectfully requested to rejoin non-elected Claim 20, and in the absence of further grounds of rejection, pass this application to issue with all pending claims.

Respectfully submitted,

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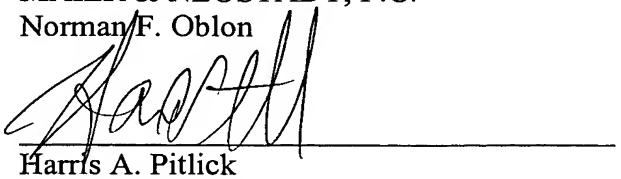

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